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AUTHOR Schwartz, Helen J.
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ABSTRACT

This document describes how computer assisted instruction and word processing can combine the systematic coverage of a writing class with the individualization of a writing workshop. Ways to revise computer programs for use in a writing course are reviewed and currently available relevant programs are detailed. The act of word processing itself is first described as having advantages in encouraging students to take meaningful risks as they write. Programs designed to aid student invention, such as TOPOI, BURKE, and TAGAI, are described, as well as SEEN, along with examples of its application. The composition process is related to the neat appearance of words on the screen, and BEGINNINGS is described as a program that details compositional related approaches to writing. Shared disks and textfiles, as well as the malleability of the screen text are identified as aids to revision, as are programs and textfiles that aid grammar and spelling study. Finally, programs that deal with organizational skills are recounted. (CRH)

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Computer Aids for Individualizing Instruction throughout the Writing Process

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by Helen J. Schwartz
English Department
Oakland University
Rochester, Michigan 48063

In teaching writing, most of us are caught in a dilemma. If we run our classes as writing workshops, we individualize instruction and treat papers as unified wholes, but we repeat ourselves often. Is this really the best use of our time? But if we run a class using a textbook, then we're usually caught in a developmental or chronological progression--from words to sentences to paragraphs to essays; or from prewriting to writing to editing. Yet recent empirical studies of writing lead up to theorize that composition is not a series of discrete, chronologically ordered tasks, but rather a complex of recursive, embedded activities (Linda Flower and John R. Hayes, "A Cognitive Process Theory of Writing," CCC, 32 [Dec. 1981], 365-387). The systematized order of a textbook, then, may help students in the long run but may not meet the current needs of any particular student at any one time. With computer aids, however, we can combine the systematic coverage of a writing class with the individualization of a writing workshop.

This paper reports on the educational philosophy and practice I've been developing so that my students and I can have the advantages of both a class and a workshop by using computer-assisted instruction (CAI) and word

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processing. For the most part, my students are using Apple microcomputers with the word processing program Applewriter II along with other programs for CAI and text-feedback. But the ideas for integrating computer aids into the composition class can be adapted for use with other systems (or have alternative forms, as noted in the references).

In writing classes, we do not teach people to write. We teach them to write better. Writing is not like arithmetic with discrete, masterable component units. It is more like performing jazz, with different parts and instruments interacting to produce an overall effect. The players need to get through the piece, even if the performance isn't very good the first time. Then perhaps different passages or different players will need special work, always with room for new improvisations. Therefore, returning to the writing half of the analogy, it makes sense to plan time in a writing class for revision. The only problem is that students often don't know how to revise and feel punished if forced to do so. Word processing can change that. Show the students an essay written with a word processor; move the last paragraph to the beginning and print it out. Students immediately realize the power of this facility. Then writing becomes a playground with revising part of the fun instead of a punishment. (How many times have you left your thesis in your last paragraph instead of your introduction because you didn't want to retype the whole thing?) For this reason, word processing is fundamental to any use of computers in teaching writing. It changes the process fundamentally, often making writers better readers of their own work, more willing revisers to clarify their ideas for other readers.

Word processing is fundamental because it makes revision easy, but the class schedule must make the ease of revising a practical, integral part of the class. For example, now I assign five papers without grading them. After each assignment has been turned in, the writer gets feedback through peer group response and my comments on these assignments. I may suggest different strategies for revision; for example,

—looking at advice and examples in my textfiles (available to the students on my computer disk or for printing out) or,

—working with several different kinds of computer-assisted instruction.

Although students must write all five assignments, they only have to revise and submit two of them for a grade.

In this way, the class encourages playful risk-taking. Each assignment calls for solving different problems in thinking and organizing. By making the assignments mandatory but non-graded at this point, I encourage the students to try out new techniques without fear of disaster. And then they can work on new revisions without undue effort and without destroying the original version.

Furthermore, I can vary my response according to my role as guide or evaluator. On the first draft, I can focus on ideas, development, audience analysis, organization and voice, virtually ignoring polishing skills concerned with spelling, grammar and punctuation (as Nancy Sommers suggests in "Responding to Student Writing," CCC, 33 [May 1982], 148-156). And I can suggest or prescribe computer aids to help the student with writing problems that appear in the draft. Or I can suggest that students look at advice or

examples stored in textfiles I make available to them. Or they can learn from sharing drafts and revisions with peers.

I'll mention the programs I use for different parts of the composing process, emphasizing programs I am currently working on for organization and development. But remember that the students may not use them in this order. Instead, they may work with them in conjunction with systematic coverage of the writing process (given on the syllabus) or I may suggest (given in comments on an assignment) that they use one or several for writing their next paper or revising the current assignment.

Invention

Students get help in coming up with something to say by using several different computer aids. For invention, they have access to Hugh Burns' computer programs based on different heuristics (or rule-of-thumb tutorials). Burns' TOPCI works with Aristotelian topics for invention (such as comparison and contrast, definition, opposites, etc.). BURKE asks questions based on Kenneth Burke's combination of the following key terms: "act," "scene," "agent," "purpose," and "agency." TAGI works with Young, Becker and Pike's tagmemic matrix, analyzing the subject as a thing in itself (particle), a thing that develops (wave), and a thing among a class of Things (field) [1].

For hypothesis testing and analysis, students can use my three-part program SEEN (the Seeing Eye Elephant Network). In the first part, the tutorial helps the student develop a more Seeing Eye: he is prompted to create an hypothesis, to provide different kinds of evidence in support of that hypothesis, and finally to consider exceptions to it. The student's

ideas are automatically signed with a pen-name and posted as a paragraph-like "notice" on the electronic bulletin board or Network, the second part of the program. On the Network, the student can see the notices of other students, comment on them, or receive comments on his own. The third part is a computer textfile which, like an Elephant, remembers and stores each individual student's "notices" and any comments made on them; a printout of the file makes this information available in paper form.

The program can be adapted to various hypothesis-testing contexts by simply changing the text of the program. At present, two versions of SEEN exist. The first asks student users to come up with an interpretation of a character in literature (hypothesis), then provide different kinds of evidence in support of that hypothesis. The second version asks them to characterize the style or period of an art work and to provide different kinds of evidence in support of that hypothesis. For example, a student hypothesizing that Picasso's "Guernica" is an example of "modernism" would be asked, "How does Picasso's choice of subject show that Guernica is an example of modernism?" After the student finishes entering evidence in response, the next question would continue, asking for examples of how Picasso's use of color shows that Guernica is an example of modernism. Then, about how the arrangement of forms supports the hypothesis; then, about the exploitation of the medium, and then, if any human subjects are shown, about how Picasso's treatment of the human body shows that Guernica is an example of modernism. Finally, to finish his "notice," the student user would be asked to consider any exceptions to his thesis [2].

In addition to heuristic CAI programs, a common disk makes group work easy as students work on defining and exploring their topics. For example, a colleague of mine, Paul Bator, has a paper topic on disk with several questions illustrating how the topic can be turned into a thesis question.

He then asks his students to add their topics to the common disk (which any student can also print out). And disks make it easy to pass copies back and forth--or to revise at a workstation with several people sitting around making suggestions that can be quickly added (or deleted or moved around) and then saved (or discarded) [3].

Finally, students may use telecommunications to find research on their topics. For certain research topics (multi-disciplinary, for example), students can do a bibliographic computer search to find information (with funds supplied by a grant from the Oakland University Alumni Association) [4]. And students may call up The Source, a commercially available information network, and search for current Associated Press stories (located by key words).

Composing

In the actual writing, the word processing program helps students write prose that is easily revisible. Their ideas always look neat, "publishable" on the screen; and a draft for pencilled revision is easily available at the push of a button commanding the printer to work. For writers stuck with writer's block or cursed with a tendency to over-revise, the screen can be turned off or blurred for short, timed periods of free writing [5]. Or students can use my program BEGINNINGS which encourages them to think about approaches to writing--how the topic arises from their personal experience, how a story or analogy illustrates the idea, how the topic is significant in a larger context.

Revision

For revision, the computers can help in several ways. First, they [illegible] function to make communication and feedback easier. Shared disks and [illegible]

textfiles can promote either individual or group work. For example, the teacher may have "advice" files available to students. I've developed a number of such files and leave them for my students to read and/or print out for themselves. One such file is about writing an "anti-paper." I recommend this technique for people who seem to be censoring and overly limiting their ideas or who put their voice in a strait-jacket. A quickly written "anti-paper" gives them the opportunity to break out--to say the unsayable, to argue the opposite side--in a form which involves actually writing but which may or may not be printed or shared with others. Then any "truth" found in the anti-paper can be integrated into the original draft in a Hegelian synthesis. My advice paper includes directions, plus an example [6]. However, I would not want to give this suggestion to all students. By recommending textfiles selectively, I can individualize how and when I administer such "advice columns."

Furthermore, though I have little empirical evidence on this, I have the feeling that students work with each other on revision--in the computer writing lab--with a sense of experimentation and "hands on" practice that only the best peer-group work provides. The text on the screen is more malleable than the text on paper. And it's always fresh and neat, always a text that readers (including the writer) can examine and respond to--adding, deleting, moving, fine tuning [7].

In addition to facilitating communication and revision, computers can make it easy for student writers to check paragraph coherence. Colette Daiute has written a program for young children which asks the writer if each paragraph has a thesis or topic sentence and, if so, to identify it. This approach

requires special programming but has the advantage of being flexible--it does not "enforce" by implication the strategy of having the topic sentence first in every paragraph. However, with some kinds of writing, the reader expects the topic in the first sentence of every paragraph, and so a technique for "abstracting" a paper in this way may prove useful in showing a writer the coherence (or incoherence) of topic sentences. With Applewriter II, it is possible to direct the program to load from a textfile only the first sentence of each paragraph.

Finally, computer programs can give text-feedback about style, grammar and spelling. Though a number of such programs exist, I've been working especially with programs that can be used with textfiles that students write with the Applewriter II word processing program [8]. For example, Sensible Speller helps writers identify and spell misspelled words. It also will print out a rough "concordance." That is, it lists all the words that appear in the textfile along with the number of times each occurs. This provides a rough check of key words. And, for homonyms, the Find and Replace capacity of the word processing program helps a writer who is aware of his characteristic misspellings of words that sound alike. Also, readability formulas can be adapted for use with textfiles, although such formulas provide very crude judgments which are useful only at the extremes (Dick-and-Jane prose or gobbledegook) [9]. Furthermore, HOMER, programmed by Michael Cohen of UCLA and based on Richard Lanham's Revising Prose, gives feedback on use of prepositions, "to be" verbs, nominalizations and "woolly words" (like "aspect," "problem," etc.) as well as providing graphs of sentence length [10].

Finally, drill and practice is available in computerized form for different aspects of punctuation and grammar. I simply suggest which segments students should work with and let them know that improvement with such mechanics will be reflected in their graded work [11].

The main pedagogical point I would stress here is that the program should not make the choices about usage for the student. These programs may serve as learning aids, offering statistical data or stylistic suggestions, but student writers need to make linguistic choices, not abdicating control or responsibility--or credit--to a machine-enforced norm.

Organization

Last but not least is organization. I am currently evaluating prototype programs I've written to help students with audience analysis and development. I discuss these programs last to emphasize that computer-assisted instruction can be prescribed throughout the writing process--as a suggestion for prewriting the next assignment or as an aid to revision. The user can get a printout of the session, and the instructor can suggest that these printouts be used to guide peer group discussion of existing drafts of the assignment. For the remainder of this paper I'd like to discuss these programs in greater detail.

The programs are interactive. That means that they demand response from the user and then modify general questions to incorporate the details of the user's particular assignment. For example, AUDIENCE ANALYSIS asks the user to type in her topic, thesis, primary audience (and any secondary audiences) as well as rhetorical purpose. If at any point the user wants further

explanation of these questions (or those that follow), she can get this help by simply typing a question mark as the sole entry after the program prompt. Also, as she clarifies her topic, she can change any of the key terms: topic, thesis, primary audience and rhetorical effect [12].

The program then continues, prompting the user to consider the audience's background and relation to the writer--in time and proximity. These questions push the writer to understand what background information, definitions and data are necessary and relevant. In addition, the user is asked about her relationship with the audience--in authority and role. This pushes the user to consider her tone and voice in her writing. Finally, the user is asked about the audience's attitudes and biases toward the subject. These questions call for the user to consider strategies of persuasion.

One student used the program AUDIENCE ANALYSIS for a revision of a paper on the advantages of flextime. She developed key terms that she then used in SUFFICE, another interactive program designed to help writers see what is necessary and relevant to their papers [13]. In SUFFICE, the student first re-entered her key words and concepts, as follows:

topic: flextime

thesis: it's a sensible idea

primary audience: general (magazine & newspaper readers)

rhetorical purpose: to show how flextime can be a sensible idea

She then had a choice of six tutorials:

1) definition of key terms

2) description

3) comparison and contrast

4) process

5) narration

6) cause and effect

On the topic flextime, for example, the definition tutorial prompts the user to define by synonym or alternate phrasing. Then the user is asked to consider what kind of information should be provided to define flextime to the user's particular audience (developed and defined in AUDIENCE ANALYSIS) and to achieve the rhetorical purpose (In the following excerpts, input from the user is underlined.):

WHAT KIND OF INFORMATION DO YOU NEED TO PROVIDE FOR GENERAL (MAGAZINE) TO DEFINE FLEXTIME IF YOU ARE TO ACHIEVE YOUR RHETORICAL PURPOSE--TO SHOW HOW FLEXTIME CAN BE A SENSIBLE IDEA? (ENTER INFO. OR ? [for explanation] OR [press] RETURN.)

? ?

FOR EXAMPLE, IF I'M DEFINING BASEBALL TO TEACH SOMEONE TO PITCH, I EMPHASIZE: THE DIFFERENCE BETWEEN A PITCHED BALL AND A STRIKE. BUT IF I'M DEFINING BASEBALL & I'M TEACHING SOMEONE TO SCORE, I EMPHASIZE: INNINGS, OUTS, HITS, WALKS & HOME RUNS.

YOUR TURN NOW.
WHAT DOES YOUR AUDIENCE NEED TO KNOW ABOUT FLEXTIME?

? what flextime is and how it works

? alternative to flextime = normal work schedules

? [carriage return to continue to the next question]

Note that the program individualizes the question in terms of the information the user has already provided: audience is "general (magazine)," the topic

"flextime" and rhetorical purpose "to show how flextime can be a sensible idea." The user can then give a definition by class and differences, by analysis of parts, or by analogy.

In a comparison and contrast tutorial, the user is asked to construct a matrix (what things will be compared vs. categories of comparison). First, she designates "flextime" and "normal" as the examples of "work schedule" she will discuss. Then the program asks how this comparison will help achieve the rhetorical purpose defined by the user. The response--"points up the advantages"--guides the user in answering the next question:

WHAT ARE THE DIFFERENT CATEGORIES FOR YOUR C&C OF FLEXTIME AND NORMAL?

? benefits to worker

? bemefits to employer

? [carriage return]

(Note that errors in spelling are not flagged and will not therefore interrupt the process of invention. The typo will be used in our example to show how the computer picks up whatever the user types in.)

After completing the matrix with these bases for comparison, the user is asked next to fill it in:

DESCRIBE FLEXTIME IN REGARD TO BENEFITS TO WORKER

? individualizes work schedule

? makes adjustments possible for working parents

? can extend vacation time by a day or two

? allows scheduling of medical-dental work w/out time off

DESCRIBE NORMAL IN REGARD TO BENEFITS TO WORKER

? [carriage return]

ARE YOU SURE YOU WANT TO SKIP THIS ONE?

? standardization allows long-term planning?

DESCRIBE FLEXTIME IN REGARD TO BEMEFITS TO EMPLOYER

? cuts absenteeism & tardiness spectacularly

? increases workers' job satisfaction

DESCRIBE NORMAL IN REGARD TO BEMEFITS TO EMPLOYER

? can cut heating & electricity bec. open a shorter time

And finally the user can consider different strategies of ordering the material to be presented. Notice how the optional explanation uses the writer's input in the excerpted illustration:

YOU COULD ORGANIZE BY CATEGORIES:

1ST SECTION: FLEXTIME VS. NORMAL

WITH REGARD TO BENEFITS TO WORKER

2ND SECTION: WITH REGARD TO BEMEFITS TO EMPLOYER

OR YOU COULD ORGANIZE BY ITEM:

1ST SECTION: FLEXTIME

WITH REGARD TO BENEFITS TO WORKER

BEMEFITS TO EMPLOYER

2ND SECTION: NORMAL

WITH REGARD TO BENEFITS TO WORKER

BEMEFITS TO EMPLOYER

At this point the user is advised to work on ordering her ideas by writing on the paper printout.

The final example I'll discuss deals with cause and effect, with the user choosing to emphasize causes or effects. The user has chosen to explore flextime as the cause of several effects, identifying the first effect as "greater employee satisfaction." The user is then asked for her logic or evidence.

FOR EXAMPLE, YOU MAY ARGUE ON THE BASIS OF EVIDENCE FROM:
—PERSONAL EXPERIENCE OR OBSERVATION
—TESTIMONY OF PARTICIPATNS (FROM DOCUMENTS OR INTERVIEWS)
—ARGUMENTS OF EXPERTS
—COLLECTIONS OF DATA OR REPORTS (FOR EX., IN NEWSPAPERS OR GOVT. REPORTS)
OR SOME OTHER KINDS OR COMBINATIONS OF EVIDENCE.

WHAT LOGIC OR EVIDENCE MAKES YOU THINK THAT GREATER EMPLOYEE SATISFACTION REALLY RESULTS FROM FLEXTIME?
? tardiness and absenteeism drop spectacularly
? my neighbor likes it bec. wife is a nurse & has changing work times & he can adapt as kids need different schedules
? he can attend parent-teacher conferecnes (never could before)

She is then asked to develop her line of reasoning with an explanation available reviewing possible logical fallacies. Finally she is asked what further sources of information would be useful and how she assesses their credibility (with explanation available about assessing such factors as bias or timeliness). Then if she wants to repeat the questions with regard to another effect of flextime, she may do so—or go on to another tutorial, or end the session.

Programs for computer-assisted instruction (CAI), like SUFFICE as well as the Seeing Eye Elephant Network (SEEN), can be easily adapted by teachers—with examples or explanations or revised questions appropriate to their classes. Such adaptability in CAI programs complements the flexibility and customizing that are possible with "advice" files and group work using word processing.

However, we need to be clear about our priorities in using this array of computer aids to help writers. Some programs are like bicycles to help us get where we're going; some are like trainer wheels to be discarded once we learn to ride. Programs like SUFFICE, SEEN, TOPOI, or HOMER can help unskilled writers develop and internalize certain skills useful in writing, but CAI is the equivalent of trainer wheels. We teachers should not prescribe such use automatically or constantly; we want our students to avoid CAI dependency. But the word processing programs and spelling checkers are like bicycles; they help us reach our goal whether we are beginners or Pulitzer Prize winners.

Computer aids can help us guide our students, with "trainer wheels" at first if need be, but ultimately leading toward independent thought and

language choices for more effective communication. English teachers across the country are trying different approaches in a variety of writing environments. Word procesing programs are improved and adapted for teaching writing; differing models of CAI are emerging on many configurations of equipment (including those listed in my notes). And that's good news for those of us who are computer novices but want to use computer aids. We don't need to become computer programmers. Our own experience and expertise are our best guides in adapting the available and developing computer aids for systematic, individualized instruction throughout the writing process.

FOOTNOTES

[1] Burns' programs are described in Hugh L. Burns and George H. Culp, "Stimulating Invention in English Composition through Computer-Assisted Instruction," Educational Technology, 20, viii (Aug. 1980), 5-10.

[2] These programs are described in my essays, "Monsters and Mentors: Computer Applications for Humanistic Education," College English, 44 (Feb. 1982), 141-152; and in "A Computer Program for Invention and Audience Feedback," presentation at the Conference on College Composition and Communication, San Francisco, March 1982, and available through ERIC Documents ED 214 177.

[3] This impression is confirmed by the experience reported by Mimi Schwartz in "Computers and the Teaching of Writing," Educational Technology, 22 (November 1982), 27-29.

[4] For a description of computer bibliographic searches plus pros and cons, see Stephen K. Stoan, "Computer Searching: A Primer for the Uninformed Scholar," Academe, 68 (Nov/Dec 1982), 10-15.

[5] Stephen Marcus and Sheridan Blau, "Not Seeing Is Relieving: Invisible Writing with Computers," unpublished manuscript.

[6] Use of "advice" files is also used by Rob Weedon, at Saint Marks School, Southborough, Massachusetts (though he uses a minicomputer system for

advice and electronic sharing of textfiles). Also, Paula Reed Nancarrow mentions this practice (and other excellent instructional approaches) in her excellent talk, "Integrating Word Processors into a Freshman Composition Curriculum," presented at the Modern Language Association, Los Angeles, December 1982.

[7] Student interaction is facilitated by networking as practiced by Rob Weedon (on a mini-computer) and as described by Lawrence A. Welsch in conjunction with his engineering class (on a large time-sharing system) in "Using Electronic Mail as a Teaching Tool," Communications of the ACM, 25 (Feb. 1982), 105-108. The positive effects of computer writing workshops are further described by Mimi Schwartz (Ed. Tech., Nov. '82) and by Robert Levin and Claire Doyle, "The Microcomputer in the Writing/Reading/Study Lab," T.H.E. Journal, 10 (Feb. '83), 77-79 ff. (for remedial students in a community college setting.

[8] On revision programs for computers other than Apples, see Cherry, Lorinda L. and W. Vesterman, "Writing Tools--The STYLE and DICTION Programs," Computing Science Technical Report, No. 91 (Murray Hill, NJ: Bell Laboratories, 1981) on Writers Workbench for a mini-computer system; Wayne Holder, "Software Tools for Writers [on the Word Plus for microcomputers]," Byte, 7 (July 1982), 138 ff. Also, Grammatik is available for CP/M systems. (Check with your computer center to see what's compatible with your equipment.)

[9] Because of their mechanical workings, readability formulas cannot judge sentence fragments or run-on sentences, and therefore give unreliable statistics with unskilled or experimental writers as I have argued in "Teaching Stylistic Simplicity with a Computerized Readability Formula,"

Communication Association, Washington, D.C., Dec. 1980. Available through ERIC Documents ED 196 014.

[10] Although HOMER uses the computer language Pascal, the textfiles written in ApplewriterII can be "translated" into a form readable by HOMER. I am indebted to Michael Cohen for making a developmental version of HOMER available to me and to Professor Jack Nachman, Mathematics Department, Oakland University, for writing such a utility program for me.

[11] Drill and practice programs are becoming readily available now. I use the grammar program developed at the University of Michigan, as described in my paper "Monsters and Mentors." The large data-base of examples, however, requires use of a time-sharing computer.

[12] I was influenced in this by the example of Valarie Arms at Drexel University whose work on a FIPSE grant has developed an audience analysis program designed especially for engineering students. I also gratefully acknowledge the work of Hugh Burns as an example and starting point for modification.

[13] Other programs dealing with development are described in William Wresch, "Computers in English Class: Finally Beyond Grammar and Spelling Drills," College English, 44 (September 1982), 483-490; and in C. Selfe and B. Wahlstrom [Michigan Technological University], "The Benevolent Beast: Computer-Assisted Instruction for the Teaching of Writing," unpublished manuscript.